CURRENT LITERATURE.

Manual of Vegetable Physiology.

A guide to laboratory exercises in vegetable physiology, the first published for the use of English speaking students, has just been issued from the press of Morris & Wilson of Minneapolis, Minn. This valuable addition to the aids for teaching physiological botany is the outcome of the needs of the flourishing department of physiology in the University of Minnesota. The work is a translation of Oels' Pflanzenphysiologische Versuche, published less than a year ago, and intended for the use of middle class schools. The translation has been prepared and printed primarily for the convenience of students in the University of Minnesota, but it has been put into such good shape, and the original text is so admirable that it will prove

specially valuable wherever elementary physiology is taught.

The translator has taken great liberties with the Roman-paged prelude to the text proper, but the body of the work has been rendered into English with fidelity, the only change of moment being the substitution of the word "photosynthesis" for that of "assimilation." This change follows from a suggestion by Dr. Barnes, made a year ago before the American Association at Madison, who clearly pointed out the need of a distinctive term for the synthetical process in plants, brought about by protoplasm in the presence of chlorophyll and light. He proposed the word "photosyntax," which met with favor. In the discussion Professor MacMillan suggested the word "photosynthesis," as etymologically more satisfactory and accurate, a claim which Dr. Barnes showed could not be maintained. The suggestion of Dr. Barnes not only received tacit acceptance by the botanists of the association, but was practically approved by the Madison Congress in the course of a discussion upon this point. In the interest of harmony, therefore, even if courtesy be ignored, the word substituted for assimilation, if any were to be inserted, should have been "photosyntax" and not "photosynthesis."

The text is made up of eighty-eight paragraphs of general statements of fact, introducing the experiments, one hundred and twentytwo in number. The illustrations show clearly how the work is to be

OELS, WALTER: Experimental plant physiology; translated and edited by D. T. MacDougal. pp. x + 86. figs. 77. 8vo. Minneapolis: Morris & Wilson. 1894. \$1.10.

done. The experiments are well selected, and not difficult to perform. A few are by no means likely to afford the degree of success that the description of the process would indicate; but this comes from inherent difficulties, and to give all necessary precautions would be likely to frighten the beginner from any attempt, which would be worse than to try with but partial success. Some of the experiments call for considerable knowledge of manipulation on the part of the instructor. However, it would be difficult to select a more satisfactory series of experiments on the whole, to illustrate the main facts of the science. Moreover, it is not necessary to use the whole series in order to present an acceptable outline, and selections can be made to meet special requirements.

The apparatus required is of the simplest kind, and is not difficult

or expensive to provide.

The majority of the experiments are of the qualitative type, and all, even the quantitative ones, are specially designed for beginners, no attempt being made to indicate the precautions or niceties of manipulation required for strictly accurate and authoritative work.

The last chapter, a short one of a page and half, on the relation of plants and animals, does not properly belong to the subject of physiology, but to that of ecology, and its omission would be preferable.

The translator has added a page of equivalents of English and metric weights and measures, and an index to the plants mentioned

in the text, for which all students will be grateful.

The printers have done fair work; some minor defects may be overlooked as due to inexperience in book-making. The paper and binding, the latter flexible cloth, are well suited to a laboratory manual.

Minor Notices.

During the summer of 1893 the Michigan Fish Commission sent a party to study the flora and fauna of Lake St. Clair. Mr. A. J. Pieters was botanist of the party, and he has now published "The plants of Lake St. Clair" as one of the bulletins of the Commission. The work is based upon that of Magnin in the lakes of the Jura. The flora was found arranged in zones limited by the depth of water, and having certain plants characteristic of each zone, although Magnin's Nupharetum did not exist.

Dr. William Trelease has published an interesting account of Leitneria Floridana, distributed in advance of the sixth annual report of the Missouri Botanical Garden. Mr. B. F. Bush discovered this species in 1892 in the lowlands of S. E. Missouri, the plants being more robust than those of Florida, and associated with other Gulf

There seems to be here an indication of the northern extension of the Gulf flora along the deep swamp-lands of the lower Mississippi. Leitneria is also reported from the Brazos in Texas, but there is some uncertainty as to the locality. A remarkable feature of Leitneria is its lightness, being the lightest of all known woods, with a specific gravity of 0.207, while ordinary cork is given as 0.240. Dr. Trelease has made a careful study of the anatomical structure of the stem, and illustrates it by the reproduction of several excellent photomicrographs. Fifteen full-page plates are given.

MR. JARED G. SMITH has published an excellent revision of the North American species of Sagittaria and Lophotocarpus, distributing it in advance of the sixth annual report of the Missouri Botanical Garden. Dr. Engelmann's notes and types served as a foundation for the work. Leaf forms prove very unsatisfactory in classification, and the least variation is found to be in the form and size of the achenium, form of the anthers, pubescence or not of the filaments, relative length of fertile and sterile pedicels, etc. Twenty-two species are recognized, three of which are Mexican, and several new, and muchtangled synonymy is straightened out. Following Buchenau and Micheli, Lophotocarpus is separated from Sagittaria. Twenty-nine full page plates accompany the revision.

THE THIRD and last part of Dr. John M. Coulter's "Manual of the Botany of Western Texas" has been issued by the Department of Agriculture. It contains the apetalæ, monocotyledons, gymnosperms, and pteridophytes. The Juncaceæ are contributed by F. V. Coville; Carex by L. H. Bailey; Gramineæ by L. H. Dewey; and Pteridophyta by L. M. Underwood. This completes, in a handy volume, the presentation of the flora of a very interesting region, whose local study was seriously interfered with by the scattered and inaccessible nature of the publications that dealt with its plants. The need of such a work has been attested by the fact of a much larger demand for the earlier parts than could be supplied.

Two "Contributions" have just been issued from the Gray Herbarium; one by Dr. B. L. Robinson (Proc. Amer. Acad. 29: 273-330), and the other by Dr. Robinson and Mr. J. M. Greenman (l. c. 382-394). In the former Dr. Robinson presents a revision of the North American Alsineæ, a continuation of his study of the Caryophyllaceæ. Of the native species Cerastium contains 16 species and varieties, Stellaria 26, Arenaria 46, Sagina 9, and Spergularia (retained instead of Tissa, thus adding to the synonymy of this much vexed group) 11. The rest of the contribution and also the second one are devoted to descriptions of plants from the Pringle collections of 1892 and 1893.

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